

PCT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 09 July 2001 (09.07.01)	Applicant's or agent's file reference P/61996/VPOW
International application No. PCT/GB00/03757	Priority date (day/month/year) 02 October 1999 (02.10.99)
International filing date (day/month/year) 02 October 2000 (02.10.00)	
Applicant ANDREWS, Stuart, William et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

27 April 2001 (27.04.01)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Pascal Piriou Telephone No.: (41-22) 338.83.38
--	--

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 April 2001 (12.04.2001)

PCT

(10) International Publication Number
WO 01/26178 A1

(51) International Patent Classification⁷: **H01P 7/06**

(21) International Application Number: **PCT/GB00/03757**

(22) International Filing Date: **2 October 2000 (02.10.2000)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
9923226.6 **2 October 1999 (02.10.1999)** **GB**

(71) Applicant (*for all designated States except US*): **MARCONI APPLIED TECHNOLOGIES LIMITED**
[GB/GB]; One Bruton Street, London W1X 8AQ (GB).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **ANDREWS, Stuart, William** [GB/GB]; 259 Ipswich Road, Colchester, Essex

CO4 4EW (GB). BARDELL, Stephen [GB/GB]; 3 Bishops Green, Barnston, Essex CM6 1NF (GB). **BRIDGES, Mark** [GB/GB]; 55 Walker Drive, Leigh-on-Sea, Essex SS9 3QT (GB). **JOHNSON, James, Robert** [GB/GB]; 31 Cypress Drive, Chelmsford, Essex CM2 9LU (GB). **SLEET, Andrew** [GB/GB]; 58 Maltese Road, Chelmsford, Essex CM1 2PA (GB).

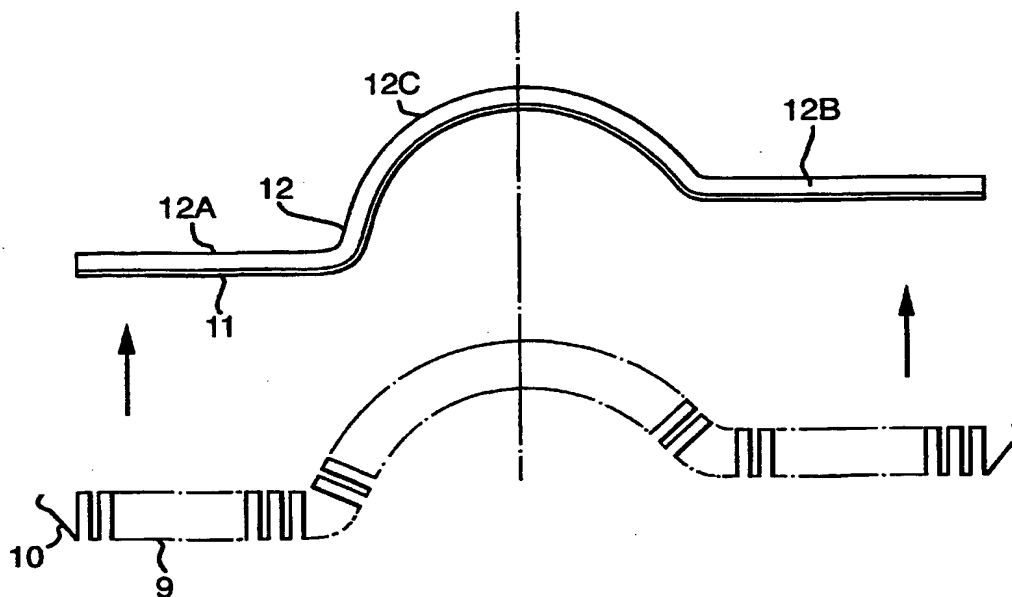
(74) Agent: **COCKAYNE, Gillian**; Marconi Intellectual Property, Waterhouse Lane, Chelmsford, Essex CM1 2QX (GB).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

[Continued on next page]

(54) Title: **HIGH FREQUENCY APPARATUS**



(57) Abstract: In a method of fabricating a tuning door for a resonant cavity, firstly contact fingers (10) are formed around the edge of a conductive plate (9) and the plate (9) is then fixed to a support (12) by, for example, double sided adhesive tape (11). The conductive plate (9) is part of the interior surface of the resonant cavity. The fingers may be formed in one operation, for example, by photo etching and are fully integral with the active surface to give optimum electrical conduction between them. Other types of high frequency apparatus where contact fingers are used to provide electrical conduction between a moveable wall and an adjacent conductive surface may also make use of the invention.

WO 01/26178 A1



patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *With international search report.*

10/089536

WO 01/26178

3 Rec'd PCT/PTO 28 MAR 2002

1:CT/GB00/03757

3/pvt

High Frequency Apparatus

This invention relates to high frequency apparatus and more particularly, but not exclusively, to apparatus which includes a high frequency resonant cavity tuning member which is moveable to vary the volume, and hence resonant frequency, of a cavity.

High frequency devices, such as, for example klystrons and inductive output tubes (IOTs), include resonant cavities in which energy of appropriate frequency is contained, electrical current moving over the interior surfaces of the cavity. The resonant frequency of a cavity may be tuned by altering its volume, one or more walls of the cavity being moveable relative to the other walls. A moveable wall of this type is commonly referred to as a "tuning door". In order for the cavities to have an effectively continuous electrical surface at the high frequencies involved, spring fingers are attached to the tuning door or doors and are pushed into contact with the adjacent fixed walls. This mechanism gives the required electrical connection whilst permitting movement of the tuning door.

Figure 1 schematically shows a known tuning door arrangement for a resonant cavity in which a tuning door 1 is moveable, in the directions shown by the arrows, relative to surrounding walls 2. The tuning door 1 has an active surface 3 that is, an interior surface of the cavity over which current flows. Strips of spring contact fingers, three of which are shown at 4, 5 and 6, are clamped to the rear surface of the door 1 via screw 7 and clamping plates 8. The screws 7 provide an electrical path between the interior active surface 3 of the tuning door 1 and the contact fingers 4, 5 and 6. The contact fingers 4, 5 and 6 bear against the surrounding walls 2 to provide electrical connection thereto. Strips are distributed around

WO 01/26178

PCT/GB00/03757

2

the entire periphery of the tuning door 1. In the arrangement shown in Figure 1, one strip is fastened to each edge of the tuning door 1. In other more complex shaped tuning doors, several strips of contact fingers may be required along an edge of a door.

According to a first aspect of the invention, high frequency apparatus comprises a
5 moveable wall having a support which carries an electrically conductive plate, being an active surface during use, with a plurality of contact fingers at the periphery of the wall which are integral with the conductive plate.

By "active surface" it is meant that the surface forms part of a cavity or transmission
10 line for high frequency radiation.

By using the invention, fabrication of cavity tuning doors or other moveable components is greatly simplified compared to prior art assemblies. The contact fingers around the periphery of the conductive plate may be formed in a single operation. This
15 contrasts with a conventional construction in which a plurality of separate strips of electrical contact fingers are separately manufactured and are then individually screwed to the cavity tuning door, each strip requiring several screws to hold it in position to the door. In the present invention, all of the electrical contact fingers may be fixed to, say, a cavity tuning door in one operation. Another advantage is that because the fingers are integral with the
20 conductive plate, there is optimum electrical connection between them, unlike the previous arrangement where there is a risk that the strips are not properly connected to the front active surface.

WO 01/26178

PCT/GB00/03757

3

The electrical contact fingers should be sufficiently flexible and springy so as to provide a good electrical contact with surrounding surfaces and thus the conductive plate should be sufficiently thin and of a suitable material to achieve this.

5 The support may provide a complete backing member to the conductive plate, being of substantially the same area and shape as the plate. In alternative embodiments, however, the support may be provided by a framework, reducing the material required and the weight of the apparatus.

10 Preferably, a single conductive plate covers the entire region of the wall. However, a plurality of plates may be fixed to the support to define the active surface. This however introduces additional fabrication steps and it is important for good electrical performance that adjoining plates are accurately aligned with one another. Where several conductive plates are used for a single moveable wall, electrical contact fingers will be provided around only part of the periphery of each plate.

15 The invention is particularly applicable to resonant cavity tuning doors but it may also be used in other types of apparatus where electrical connection is required by the use of contact fingers. For example, it may find use for altering the length of waveguide terminations or in screening apparatus such as a Faraday cage, to shield from external electrical influences.

According to a second aspect of the invention, a method for manufacturing a moveable wall for high frequency apparatus includes the steps of taking a plate of conductive

WO 01/26178

PCT/GB00/03757

4

material; forming contact fingers at the periphery of the plate; and then mounting the plate on a support.

Typically, the plate is of beryllium copper and following the formation of the fingers and any subsequent bending to form the fingers into the right configuration to give a spring "spoon" shape, the plate is gold or silver plated. This gives a good electrically conductive active surface and reduces or eliminates atmospheric tarnishing. The plate may be silver plated and the tips of the contact fingers gold plated.

The fingers may preferably be formed by etching for example by photo etching, giving good accuracy as this can be computer controlled. Other techniques involving cutting or stamping could be used instead.

The design flexibility afforded by the invention permits the configuration of the fingers and/or their spatial distribution to be quite complex if necessary, for example to take into account the configuration of the moveable wall in the finished apparatus. For example, where the wall is curved, the finger profiles may vary along the periphery to give a more uniform distribution of contact points in the final assembly.

The plate may be fixed to the support by, for example, double-sided adhesive tape, fastenings through the plate, clamping the plate to the support, or any other convenient arrangement. Alternatively, a liquid adhesive may be applied to the rear surface of the plate and/or to the support and subsequently cured. An advantage of using liquid adhesive or adhesive tape is that it allows the plate to be attached to the support in one step in the

WO 01/26178

PCT/GB00/03757

5

assembly process, and additional fixation components are not required.

Some ways in which the invention may be performed are now described by way of example with reference to the accompanying drawings in which:

Figures 2 to 5 schematically illustrate the steps in a method of manufacturing a tuning door for a resonant cavity included in high frequency apparatus;

Figure 6 schematically shows the finished apparatus tuning door in situ in a resonant cavity, only part of which is shown; and

Figures 7 and 8 schematically illustrate in plan view other tuning doors in accordance with the invention.

In a method of fabricating a cavity tuning door and with reference to Figure 2 which is a plan view, firstly, a rectangular plate 9 of beryllium copper is taken. This is etched using conventional photo etching techniques to define a plurality of fingers 10 around the periphery of the plate as shown in Figure 3, also a plan view. In this case, the fingers 10 are formed around the entire periphery of the plate 9. Following this step, the fingers 10 are bent at right-angles to the plane of sheet and their ends further curved to give the spring "spoon" shape, as shown in Figure 4 which is an isometric view. The plate is then silver plated to give a good conductive surface.

As shown in Figure 5, double-sided adhesive tape 11 is then applied to the surface of a support 12, the plate 9 and support 12 being illustrated with their major surfaces normal to the page. In this case the support 12 has the same shape as the tuning door in the finished device. It has two flat planar parts 12A and 12B and a central part-cylindrical part 12C. The

WO 01/26178

PCT/GB00/03757

6

plate 9 is offered up and fixed to the support 12 by means of the adhesive tape 11, to thus form the tuning door 14.

As shown in Figure 6, the tuning door 13 is then incorporated into the resonant cavity, being moveable in the directions shown by the arrows by means of mechanism 14 at the rear of the support 12.

Figure 7 shows an alternative arrangement, in which the support consists of an open framework 15 on which the plate 16 is mounted, the contact fingers being indicated at 17. The tuning door is of similar shape to that shown in Figure 6, having a central part-cylindrical part.

In another arrangement shown in Figure 8, the conductive surface 18 of a tuning door 19 is formed from several separate conductive plates 20, 21, 22, 23 and 24 located adjacent one another. Each of these conductive plates 20 to 24 has fingers 20A to 24A formed along only part of its periphery.

WO 01/26178

PCT/GB00/03757

7

Claims

1. High frequency apparatus comprising a moveable wall having a support which carries an electrical conductive plate, being an active surface during use, with a plurality of contact fingers at the periphery of the wall which are integral with the conductive plate.

5

2. Apparatus as claimed in claim 1 wherein the support is substantially the same area and shape as the conductive plate.

3. Apparatus as claimed in claim 1 wherein the support is a framework.

10

4. Apparatus as claimed in claim 1, 2 or 3 wherein a single conductive plate defines the active surface of the moveable wall.

5. Apparatus as claimed in any preceding claim wherein contact fingers are included around the entire periphery of the moveable wall.

15

6. Apparatus as claimed in any preceding claim wherein the moveable wall is a tuning door for a resonant cavity.

20

7. A method for manufacturing a moveable wall for high frequency apparatus including the steps of: taking a plate of conductive material; forming contact fingers at the periphery of the plate; and then mounting the plate on a support.

WO 01/26178

PCT/GB00/03757

8

8. A method as claimed in claim 7 wherein the fingers are formed by photoetching.

9. An apparatus or a method as claimed in any preceding claim wherein the conductive plate is of beryllium copper.

5 10. A method or apparatus as claimed in claim 9 wherein the plate is gold or silver plated.

11. A method or apparatus as claimed in any preceding claim wherein the plate is fixed to the support by adhesive.

10 12. A method or apparatus as claimed in claim 11 wherein the plate is fixed to the support by adhesive tape.

13. A high frequency apparatus substantially as illustrated in and described with reference to Figures 6, 7 or 8 of the accompanying drawings.

15

14. A method substantially as illustrated in and described with reference to Figures 2 to 8 of the accompanying drawings.

10/089536

WO 01/26178

PCT/GB00/03757

1/3

Fig.1.

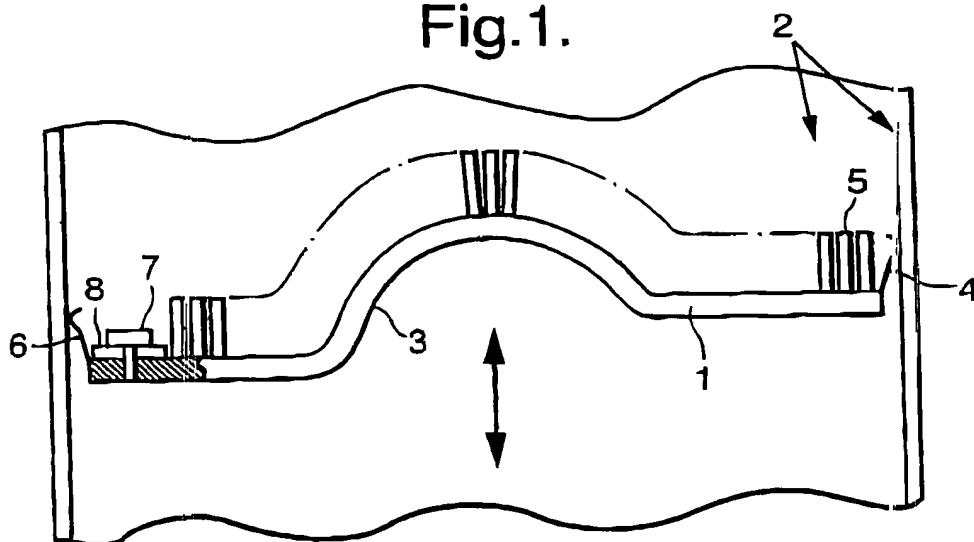


Fig.2.

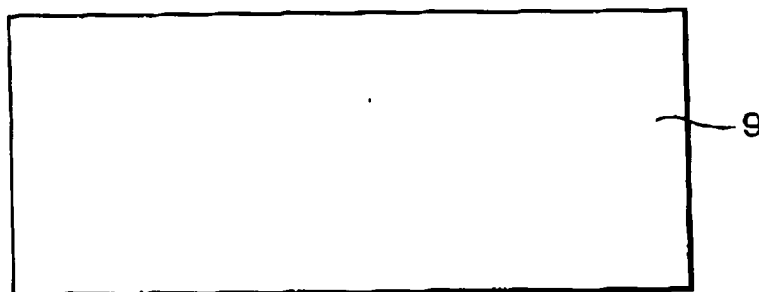
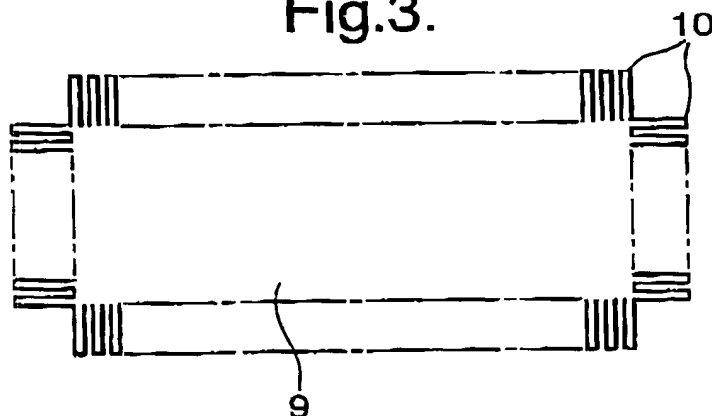


Fig.3.



SUBSTITUTE SHEET (RULE 26)

10/089536

WO 01/26178

PCT/GB00/03757

2/3

Fig.4.

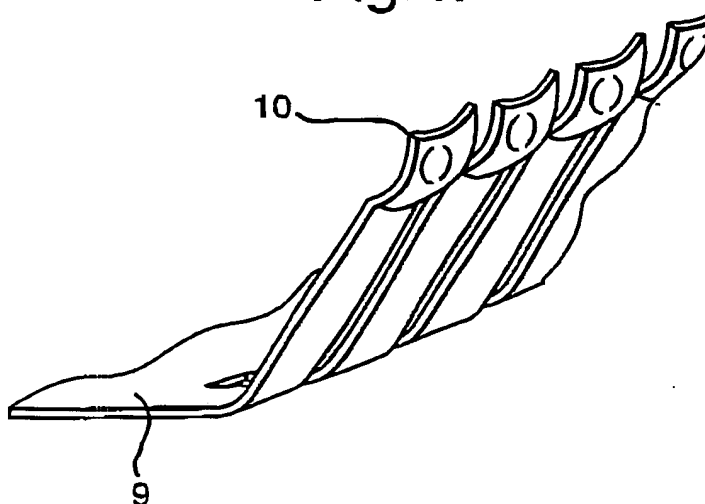
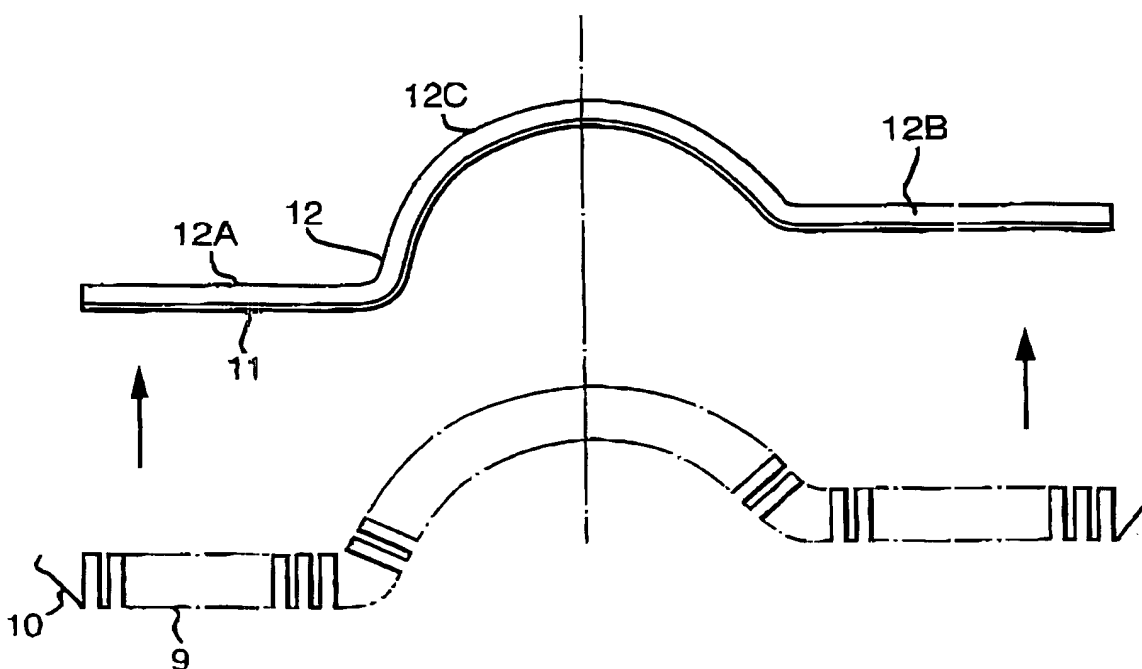


Fig.5.



SUBSTITUTE SHEET (RULE 26)

10/089536

WO 01/26178

PCT/GB00/03757

3/3

Fig.6.

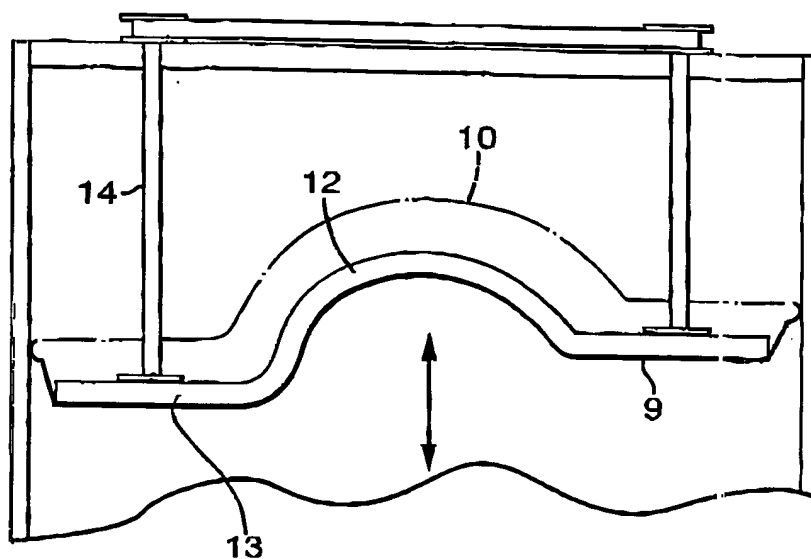


Fig.7.

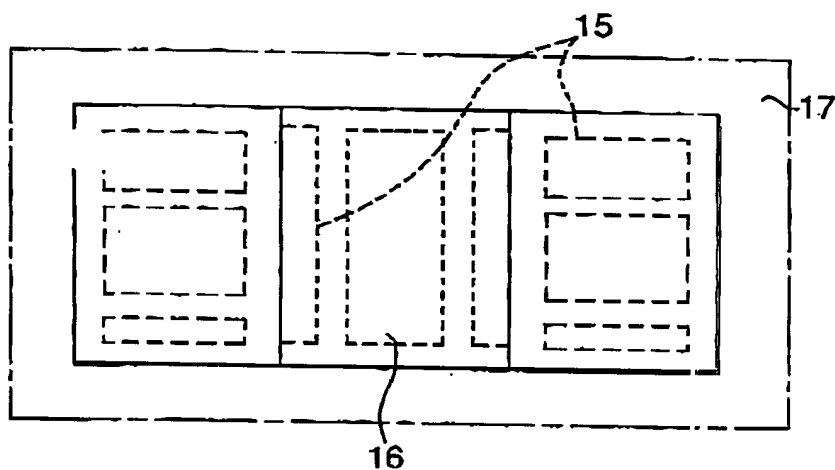
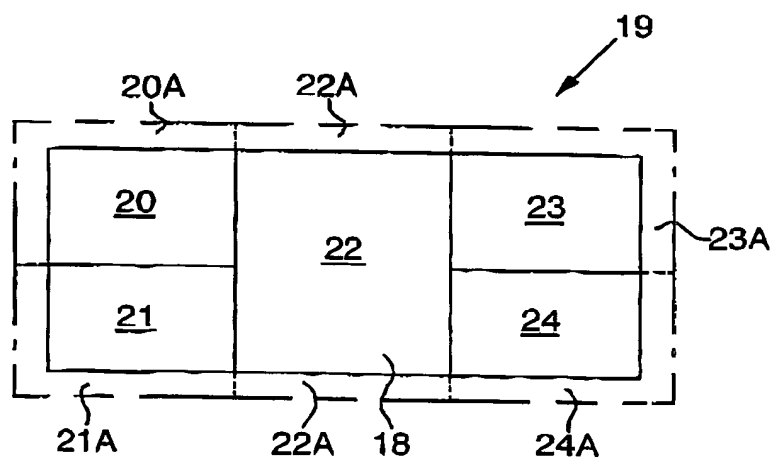


Fig.8.



SUBSTITUTE SHEET (RULE 26)

INTERNATIONAL SEARCH REPORT

Internat'l Application No

PCT/GB 00/03757

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01P7/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01P H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 940 364 C (SIEMENS & HALSKE AKTIENGESELLSCHAFT) 15 March 1956 (1956-03-15) the whole document	1, 2, 4-7
Y	---	9
Y	GB 588 526 A (DOUGLAS HAROLD TOMLIN) 26 June 1947 (1947-06-26) page 2, line 31 - line 48; figure 2	9
X	FR 2 451 111 A (DE PRUINES ISECO SA) 3 October 1980 (1980-10-03) the whole document	1, 4-7

	-/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance: the claimed invention cannot be considered to involve a inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

4 January 2001

Date of mailing of the international search report

18/01/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl
Fax: (+31-70) 340-3016

Authorized officer

Den Otter, A

INTERNATIONAL SEARCH REPORT

Internat'l Application No
PCT/GB 00/03757

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication where appropriate, of the relevant passages	Relevant to claim No.
A	T. MORENO, A.M.: "MICROWAVE TRANSMISSION DESIGN DATA" 1948, MCGRAW-HILL BOOK COMPANY, INC., NEW YORK XPD02154978 page 173 -page 174; figures 10-15; tables 10-1	10
A	US 2 523 725 A (SCHMIDT) 26 September 1950 (1950-09-26) column 3, line 31 - line 67; figures 2-4	1,7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 00/03757

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 940364	C	NONE	
GB 588526	A	NONE	
FR 2451111	A	03-10-1980	NONE
US 2523725	A	26-09-1950	NONE

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF RECEIPT OF
RECORD COPY

(PCT Rule 24.2(a))

To:

COCKAYNE, Gillian
Marconi Intellectual Property
Waterhouse Lane
Chelmsford
Essex CM1 2QX
ROYAUME-UNI

21 NOV 2000	

Date of mailing (day/month/year) 09 November 2000 (09.11.00)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference P/61996/VPOW	
	International application No. PCT/GB00/03757

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

MARCONI APPLIED TECHNOLOGIES LIMITED (for all designated States except US)
ANDREWS, Stuart, William et al (for US)

International filing date : 02 October 2000 (02.10.00)
Priority date(s) claimed : 02 October 1999 (02.10.99)
Date of receipt of the record copy
by the International Bureau : 26 October 2000 (26.10.00)

List of designated Offices :

AP : GH,GM,KE,LS,MW,MZ,SD,SL,SZ,TZ,UG,ZW
EA : AM,AZ,BY,KG,KZ,MD,RU,TJ,TM
EP : AT,BE,CH,CY,DE,DK,ES,FI,FR,GB,GR,IE,IT,LU,MC,NL,PT,SE
OA : BF,BJ,CF,CG,CI,CM,GA,GN,GW,ML,MR,NE,SN,TD,TG
National : AE,AG,AL,AM,AT,AU,AZ,BA,BB,BG,BR,BY,BZ,CA,CH,CN,CR,CU,CZ,DE,DK,DM,DZ,EE,
ES,FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KP,KR,KZ,LC,LK,LR,LS,LT,LU,LV,MA,
MD,MG,MK,MN,MW,MX,MZ,NO,NZ,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,US,
UZ,VN,YU,ZA,ZW

ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex relating to:

- ☒ time limits for entry into the national phase
☐ confirmation of precautionary designations
☒ requirements regarding priority documents

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer: Dorinique DELMAS Telephone No. (41-22) 338.13.38
--	--

ANNEX TO FORM PCT/IB/301

International application No.

PCT/GB00/03757

INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated in the Notification of Receipt of Record Copy (Form PCT/IB/301) by paying national fees and furnishing translations, as prescribed by the applicable national laws.

The time limit for performing these procedural acts is **20 MONTHS** from the priority date or, for those designated States which the applicant elects in a demand for international preliminary examination or in a later election, **30 MONTHS** from the priority date, provided that the election is made before the expiration of 19 months from the priority date. Some designated (or elected) Offices have fixed time limits which expire even later than 20 or 30 months from the priority date. In other Offices an extension of time or grace period, in some cases upon payment of an additional fee, is available.

In addition to these procedural acts, the applicant may also have to comply with other special requirements applicable in certain Offices. It is the applicant's responsibility to ensure that the necessary steps to enter the national phase are taken in a timely fashion. Most designated Offices do not issue reminders to applicants in connection with the entry into the national phase.

For detailed information about the procedural acts to be performed to enter the national phase before each designated Office, the applicable time limits and possible extensions of time or grace periods, and any other requirements, see the relevant Chapters of Volume II of the PCT Applicant's Guide. Information about the requirements for filing a demand for international preliminary examination is set out in Chapter IX of Volume I of the PCT Applicant's Guide.

GR and ES became bound by PCT Chapter II on 7 September 1996 and 6 September 1997, respectively, and may, therefore, be elected in a demand or a later election filed on or after 7 September 1996 and 6 September 1997, respectively, regardless of the filing date of the international application. (See second paragraph above.)

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date. If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with an indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.

REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity to furnish the priority document within a time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

PATENT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

COCKAYNE, Gillian
Marconi Intellectual Property
Waterhouse Lane
Chelmsford
Essex CM1 2QX
ROYAUME-UNI

24 NOV 2000

Date of mailing (day/month/year) 17 November 2000 (17.11.00)	
Applicant's or agent's file reference P/61996/VPOW	IMPORTANT NOTIFICATION
International application No. PCT/GB00/03757	International filing date (day/month/year) 02 October 2000 (02.10.00)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 02 October 1999 (02.10.99)
Applicant MARCONI APPLIED TECHNOLOGIES LIMITED et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(*) appearing next to a date of receipt in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
02 Octo 1999 (02.10.99)	9923226.6	GB	01 Nove 2000 (01.11.00)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Magda BOUACHA
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 335.83.38

PATENT COOPERATION TREATY

PCT

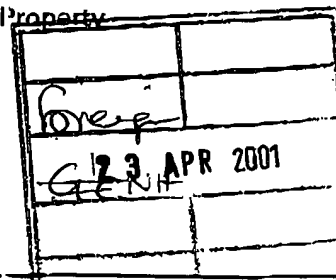
From the INTERNATIONAL BUREAU

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

COCKAYNE, Gillian
Marconi Intellectual Property
Waterhouse Lane
Chelmsford
Essex CM1 2QX
ROYAUME-UNI



Date of mailing (day/month/year)

12 April 2001 (12.04.01)

Applicant's or agent's file reference

P/61996/VPOW

IMPORTANT NOTICE

International application No.

PCT/GB00/03757

International filing date (day/month/year)

02 October 2000 (02.10.00)

Priority date (day/month/year)

02 October 1999 (02.10.99)

Applicant

MARCONI APPLIED TECHNOLOGIES LIMITED et al

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AU, KP, KR, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE, AG, AL, AM, AP, AT, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EA, EE, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OA, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TF, TT, TZ, UA, UG, UZ, VN, YU.
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 12 April 2001 (12.04.01) under No. WO 01/26178

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

J. Zahra

Facsimile No. (41-22) 740.14.35

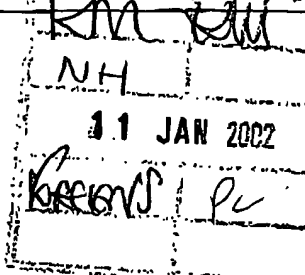
Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

COCKAYNE, Gillian
MARCONI Int. Property
Waterhouse Lane
Chelmsford
Essex CM1 2QX
GRANDE BRETAGNE



PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 09.01.2002

Applicant's or agent's file reference
P/61996/VPOW

IMPORTANT NOTIFICATION

International application No.
PCT/GB00/03757

International filing date (day/month/year)
02/10/2000

Priority date (day/month/year)
02/10/1999

Applicant
MARCONI APPLIED TECHNOLOGIES LIMITED

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Schmethüsen, S
Tel. +49 89 2399-2567



PATENT COOPERATION TREATY

PCT



REC'D 11 JAN 2002

WIPO

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P/61996/VPOW	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/03757	International filing date (day/month/year) 02/10/2000	Priority date (day/month/year) 02/10/1999
International Patent Classification (IPC) or national classification and IPC H01P7/06		
Applicant MARCONI APPLIED TECHNOLOGIES LIMITED		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none">I <input checked="" type="checkbox"/> Basis of the reportII <input type="checkbox"/> PriorityIII <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicabilityIV <input type="checkbox"/> Lack of unity of inventionV <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statementVI <input type="checkbox"/> Certain documents citedVII <input type="checkbox"/> Certain defects in the international applicationVIII <input checked="" type="checkbox"/> Certain observations on the international application		
Date of submission of the demand 27/04/2001	Date of completion of this report 09.01.2002	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Van der Peet, H Telephone No. +49 89 2399 2764 	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/03757

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-6 as originally filed

Claims, No.:

1-14 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/03757

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 13,14.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 13,14 are so unclear that no meaningful opinion could be formed (*specify*):
see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Yes: Claims 3,6,8-12

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/03757

	No:	Claims	1,2,4,5,7
Inventive step (IS)	Yes:	Claims	
	No:	Claims	3,6,8-12
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

In order to facilitate easy reference the documents cited in the International Search Report are numbered **seriatim** D1 to D5.

1. Patent document D1 (DE-C-940365) discloses an
high frequency apparatus comprising a movable wall having a support (9) which carries an electrically conductive plate (4), being an active surface during use (i.e. the surface forms part of a cavity (1-6), cf. D1: page 2, lines 44-48) with a plurality of contact fingers (8) at the periphery of the wall which are integral with the conductive plate (4).

Claim 1 is hence readable onto the subject matter known from document D1. The subject matter of claim 1 therefore lacks novelty (Article 33(2) PCT).

The subject matter of the corresponding method claim 7 lacks therefore equally novelty (cf. claim of D1, Article 33(2) PCT).

The features of claims 2, 4 and 6 are known from document D1. Document D1 clearly specifies the purpose of the support, i.e. the skilled man recognizes immediately that this purpose can be equally attained with a framework. Document D1 teaches that the door (4) merely needs contacts in the direction of the E-field (cf. page 2, lines 44-48). The skilled man will therefore provide contact fingers around the entire periphery in the event the cavity mode so requires. The subject matter of claims 3 and 6 is thus rendered obvious by the technical teaching of document D1 (Article 33(3) PCT).

Claim 8 refers to a standard technique for the forming of metal fingers. Claim 9 alludes to a standard material in the context of hf apparatus. Claims 11 and 12 pertain to standard fixing techniques.

2. Claims 13 and 14 offend the proscription of Rule 6.2(a). They are moreover unclear (Article 6 PCT).

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P/61996/VP0W	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 00/ 03757	International filing date (day/month/year) 02/10/2000	(Earliest) Priority Date (day/month/year) 02/10/1999
Applicant MARCONI APPLIED TECHNOLOGIES LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

5
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT 00/03757

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01P7/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01P H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 940 364 C (SIEMENS & HALSKE AKTIENGESELLSCHAFT) 15 March 1956 (1956-03-15) the whole document	1, 2, 4-7
Y	---	9
Y	GB 588 526 A (DOUGLAS HAROLD TOMLIN) 26 June 1947 (1947-06-26) page 2, line 31 - line 48; figure 2	9
X	FR 2 451 111 A (DE PRUINES ISECO SA) 3 October 1980 (1980-10-03) the whole document	1, 4-7
	--- -/-	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

4 January 2001

Date of mailing of the international search report

18/01/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Den Otter, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT 00/03757

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	T. MORENO, A.M.: "MICROWAVE TRANSMISSION DESIGN DATA" 1948 , MCGRAW-HILL BOOK COMPANY, INC. , NEW YORK XP002154978 page 173 -page 174; figures 10-15; tables 10-1 -----	10
A	US 2 523 725 A (SCHMIDT) 26 September 1950 (1950-09-26) column 3, line 31 - line 67; figures 2-4 -----	1,7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT 00/03757

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 940364	C	NONE	
GB 588526	A	NONE	
FR 2451111	A	03-10-1980	NONE
US 2523725	A	26-09-1950	NONE